DETAILED ACTION

Status of the Claims

Claim(s) 99-104 and 106-119 are pending. Claims 99-104, 106-113, 118, and 119 are under examination. The following Office Action is in response to Applicant's communication dated October 22, 2010.

Specification

The objection to the specification has been withdrawn in view of Applicant's amendments.

Claim Rejections - 35 USC § 112 - Indefiniteness - Withdrawn

Applicant's claim amendments are sufficient to overcome the rejection of claim(s) 112 presented in the Office Action dated July 22, 2010. Thus, the rejection has been withdrawn.

Claims Amendments

It is noted that the term "recombinant enzyme" finds support in the specification in example 5 on page 23. The HotMaster Taq DWA polymerase is a recombinant polymerase enzyme.

Claim Rejections - 35 USC § 102 - Withdrawn

Applicant's claim amendments and supplemental remarks are sufficient to overcome the rejection of claim(s) 99-106, 111, and 112 over Rubinsky, and claims 99-101, 107, and 112 over Demmer. Thus, the rejection has been withdrawn.

Claim Rejections - 35 USC § 103 - New Grounds

The following rejection(s) are made in view of made in view of Applicant's amendments.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

1. Claim(s) 99-106, 111, and 112 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rubinsky et al. (WO 92/12722 A1; 6 August 1992) in view of Duesbury et al. (U.S. 6,485,925 B1).

Rubinsky teaches a solution comprising an anti-freeze protein (AFP) and an enzyme; wherein the enzyme retains its activity after at least one freeze-thaw event (pg. 38-46, for example). Specifically, the reference teaches oocyte preservation utilizing a solution comprising: a Type I AFP (pg. 17-24; pg. 37-46, 40mg/ml) and an enzyme (the oocytes naturally contain enzymes including DNA polymerase; pg. 37-46, presents evidence that the cells can survive freeze-thaw events). The solution further comprises: glycol, glycerol, buffer (PBS), BSA, glucose (pg. 39, AVS solution). Rubinsky does not expressly teach a solution comprising a recombinant enzyme.

First, it is noted that the expression of recombinant proteins within oocyte tissue was a well known concept at the time of invention.

Duesbury provides a supportive disclosure that recites,

"In oocytes, synthesis of Mos activates the MAPK pathway. Insulin alsactivates the MAPK pathway. This pathway is essential for activation of maturation promoting factor (MPF) and the resumption of meiosis, i.e., maturation. Oocytes can be isolated from any convenient source according to standard methods, e.g., frog, fish, or mammalian, e.g., mouse or bovine oocytes. After LF or an LF homologue or mimetic is introduced to the oocytes, optionally with a modulator, the oocytes are induced to mature, e.g., for *Xenopus* oocytes, with progesterone or insulin, for fish oocytes, with dihydroxyprogesterone. Mammlian oocytes do not need induction as they spontaneously mature upon isolation. Alternatively, recombinant or naturally occurring Mos can be injected into the oocyte to activate the MAPK pathway. The oocytes are then cultured according to standard conditions (see, e.g.,Duesbery et al., Proc. Natl. Acad. Sci. USA 94:9165-9170 (1997); see also Freshney, Culture of Animal Cells, A Manual of Basic Technique (3rd ed. 1994)).

Thus, in summary, it is submitted that it would have been *prima facie* obvious to a person of ordinary skill in the art at the time of invention wanting to cryopreserve the oocytes outlined in Duesbury to create a cryoprotectant solution comprising such oocytes and the AFP solutions of Rubinksy since the prior art demonstrates the AFP solutions as cryoprotectant additives.

2. Claim(s) 99-107 and 111-113 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kemp et al. (U.S. 5,536,648) in view of Neilson et al. (U.S. 5,605,824), in view of Demmer et al. (U.S. 7,132,263 B2), and in further view of Rubinsky et al. (WO 92/12722 A1; 6 August 1992).

Kemp teaches a frozen PCR mix composition comprising: a DNA polymerase enzyme and dNTPs (col. 7, line 30-45; col. 13, example 3, for example).

Kemp does not expressly teach a recombinant enzyme or anti-freezing protein.

With regard to recombinant enzymes, recombinant polymerase enzymes were well known at the time of invention. Neilson provides a supportive disclosure that teaches a recombinant form of Taq polymerase (col. 14, teaches AmpliTaq).

Demmer provides a supportive disclosure that teaches a solution comprising an anti-freeze protein (AFP) (abstract; example 3, for example).

The Demmer reference further recites,

"The scope for AFP applications extends from genetically modifying prokaryotic or eukaryotic organisms to produce formerly non-resident AFP proteins, into areas where AFPs are used as additives for cryoprotection. An example of this is molecular biology reagents such as restriction endonucleases, DNA modifying enzymes, DNA

polymerases and associated buffers which are sensitive to freeze thaw. Molecular biology reagents which are particularly sensitive to freezing, such as in vitro transcription/translation systems could potentially benefit by the presence of AFPs. Whole cells, such as preparations of Escherichia coli, yeasts, blood platelets, red blood cells, ova and sperm, in addition to multicelluar complexes such as embryos and whole organs, could be protected by the ice restructuring properties of AFPs. (col. 2)

As outlined above, Rubinsky teaches AFP solutions.

Thus, in summary, it is submitted that it would have been *prima facie* obvious to a person of ordinary skill in the art at the time of invention to add the AFP solutions of Rubinsky to the solutions of Kemp since Rubinsky demonstrates their AFP as an effective anti-freezing component.

3. Claims 108-110 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rubinsky et al. (WO 92/12722 A1; 6 August 1992) in view of Duesbury et al. (U.S. 6,485,925 B1) OR Kemp et al. (U.S. 5,536,648) in view of Neilson et al. (U.S. 5,605,824), in view of Demmer et al. (U.S. 7,132,263 B2), in view of Rubinsky et al. (WO 92/12722 A1; 6 August 1992) as applied to claim 106 above, and in further view of Carpenter (U.S. 4,806,343).

The teachings of the previously applied reference(s) have been outlined in the above rejections. The previously applied reference(s) do not expressly teach sorbitol or trehalose.

As demonstrated by Carpenter provides, it was well known in the prior art that sorbitol and trehalose were common additives in protein cryoprotectant solution (bottom col. 3).

Thus, in summary, it is submitted that it would have been *prima facie* obvious to a person of ordinary skill in the art at the time of invention to add sorbitol and/or trehalose to the solutions of Rubinsky since the prior art demonstrates reagents as cryoprotectant additives.

4. Claims 118 and 119 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rubinsky et al. (WO 92/12722 A1; 6 August 1992) in view of Duesbury et al. (U.S. 6,485,925 B1) OR Kemp et al. (U.S. 5,536,648) in view of Neilson et al. (U.S. 5,605,824), in view of Demmer et al. (U.S. 7,132,263 B2), in view of Rubinsky et al. (WO 92/12722 A1; 6 August 1992) as applied to claim 106 above, Stratagene ("Gene Characterization Kits" 1988).

The methods of the previously applied reference(s) have been outlined in the above rejections. The previously applied reference(s) do not expressly teach kits of reagents.

Stratagene catalog provides a supportive teaching that highlights a motivation to combine reagents into kit format (pg. 39, for example).

In summary, it is submitted that it would have been *prima facie* obvious to a person of ordinary skill in the art at the time the invention was made to combine the reaction reagents as taught by Rubinsky into a kit format as discussed by Stratagene catalog since the Stratagene catalog teaches a motivation for combining reagents of use in an assay into a kit, "Each kit provides two services: 1) a variety of different

reagents have been assembled and pre-mixed specifically for a defined set of experiments. Thus one need not purchase gram quantities of 10 different reagents, each of which is needed in only microgram amounts, when beginning a series of experiments. When one considers all of the unused chemicals that typically accumulate in weighing rooms, desiccators, and freezers, one quickly realizes that it is actually far more expensive for a small number of users to prepare most buffer solutions from the basic reagents. Stratagene provides only the quantities you will actually need, premixed and tested. In actuality, the kit format saves money and resources for everyone by dramatically reducing waste. 2) The other service provided in a kit is quality control" (pg. 39, col. 1, for example).

Conclusion

No claims are allowed.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher M. Babic whose telephone number is 814-880-9945. The examiner can normally be reached on Monday-Friday 10:00AM to 6:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion can be reached on 571-272-0782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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